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Abstract

A NEW ORDERED STRUCTURE CREATED BY NEUTRON IRRADIATION

by M.M. L. NEEL
D. DAUTREPPE
J. PAULEVE
J. LAUGIER
R. PAUTHENET
A. MARCHAND

(Commissariat à l'Energie Atomique, France)

Neutron irradiation at 300°C in the swimming pool reactor MELUSINE of an Fe-Ni (50 p. 100 at) alloy yields by the acceleration of the diffusion process, a new ordered phase of this alloy, the same type as AuCu.

Evolution is traced by magnetic anisotropy, electrical resistance and X-ray measurements. The surstructure rays obtained confirm the quadratic structure of the AuCu type. The critical temperature determined by the measurement of the electrical resistance in the reactor is about 320°C $\pm$ 2°C. Studies of monocrystals irradiated in a magnetic field have given precise details about the magnetic behaviour of this new alloy which is arranged in small crystallites whose general configuration favorises its orientation in the direction of the magnetic field applied during irradiation.

The interest of this study consists in the manifold industrial applications of iron and nickel alloys.

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